AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of determining the efficacy of a probiotic as a treatment of irritable bowel syndrome ~~inflammatory diseases of the bowel~~ in mammals *in vivo* comprising the steps of:

a) measuring the level of at least one anti-inflammatory cytokine selected from the group consisting of interleukin-10, transforming growth factor-β, interleukin-4, interleukin-5, interleukin-13, and combinations thereof and at least one pro-inflammatory cytokine selected from the group consisting of interleukin-12, tumour necrosis factor-α, interferon-γ, interleukin-2, and combinations thereof in a supernatant from cells cultured from a biological sample from a mammalian subject wherein said biological sample is selected from the group consisting of a biopsy sample from the bowel, peripheral blood mononuclear cells without *in vitro* stimulation, peripheral blood mononuclear cells with *in vitro* stimulation, gut lymphoid tissues without *in vitro* stimulation, gut lymphoid tissues with *in vitro* stimulation, and combinations thereof;

b) determining the ratio of the level of the at least one anti-inflammatory cytokine to the level of the at least one pro-inflammatory cytokine;

c) administering said treatment;

d) measuring the level of the at least one anti-inflammatory cytokine and the at least one pro-inflammatory cytokine in a supernatant from cells cultured from a biological sample from said mammalian subject at a time following administration of said treatment;

e) determining the ratio of the level of the at least one anti-inflammatory cytokine to the level of the at least one pro-inflammatory cytokine following administration of said treatment;

wherein an increase in the ratio of the levels of anti-inflammatory cytokine to pro-inflammatory cytokine following the administration of said treatment is indicative of the efficacy of said treatment for irritable bowel syndrome ~~inflammatory diseases of the bowel~~, and no change or a decrease in the ratio of the levels of anti-inflammatory to pro-inflammatory cytokine following the administration of said treatment is indicative of lack of efficacy of said treatment for irritable bowel syndrome ~~inflammatory diseases of the bowel~~.

2. (Canceled)

3. (Previously Presented) The method according to claim 1 wherein the anti-inflammatory cytokine is selected from the group consisting of interleukin-10, transforming growth factor-β, and combinations thereof.

4. (Canceled)

5. (Previously Presented) The method according to claim 1 wherein the pro-inflammatory cytokine comprises interleukin-12, tumour necrosis factor-α, interferon-γ, or combinations thereof.

6. (Previously Presented) The method according to claim 1, wherein said ratio of the level of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio of the level of interleukin-10 to the level of interleukin-12.

7. (Currently Amended) The method according to claim 1, wherein said ratio of the level ~~the level~~ of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio of the level of transforming growth factor-β to the level of interleukin-12.

8. (Previously Presented) The method according to claim 1, wherein said ratio of the level of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio of the level of interleukin-10 to the level of interferon-γ.

9. (Canceled)

10. (Canceled)

11. (Previously Presented) The method according to claim 1 wherein said biological sample comprises peripheral blood mononuclear cells with *in vitro* stimulation, peripheral blood mononuclear cells without *in vitro* stimulation, or combinations thereof.

12. (Previously Presented) The method according to claim 1 wherein said *in vitro* stimulation comprises stimulation with a mitogen, a probiotic, an anti-CD3 molecule, or combinations thereof.

13. (Withdrawn) The method according to claim 12, wherein said *in vitro* stimulation comprises stimulation with a mitogen.

14. (Withdrawn) The method according to claim 13 wherein said mitogen comprises a lipopolysaccharide, lectin, superantigen, or combinations thereof.

15. (Withdrawn) The method according to claim 14, wherein said lectin comprises concanavalin A, phytohemagglutinin, pokeweed mitogen, or combinations thereof.

16. (Previously Presented) The method according to claim 1 further comprising a means for measuring the levels of said at least one anti-inflammatory cytokine in said biological sample, wherein said means measures mRNA or protein expression and comprises ELISAs, radioimmunoassays, multiplexed ELISAs on microarray platforms, multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems, bioassays, Western blots,

chromatograph-based separation systems, RT-PCR, competitive reverse transcription PCR, Northern blots, gene arrays, direct measurement of m-RNA, or combinations thereof.

17. (Previously Presented) The method according to claim 16 wherein the means for measuring the levels of anti-inflammatory cytokines in said biological sample comprises ELISAs, RIAs, multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems, or combinations thereof.

18. (Previously Presented) The method according to claim 17 wherein the means for measuring the levels of said at least one anti-inflammatory cytokine in said biological sample comprises multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection system.

19. (Previously Presented) The method according to claim 1 further comprising a means for measuring the levels of said at least one pro-inflammatory cytokine in said biological sample, wherein said means measures mRNA or protein expression and comprises ELISAs, radioimmunoassays, multiplexed ELISAs on microarray platforms, multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems, bioassays, Western blots, chromatograph-based separation systems, RT-PCR, competitive reverse transcription PCR, Northern blots, gene arrays, direct measurement of m-RNA, or combinations thereof.

20. (Previously Presented) The method according to claim 19 wherein the means for measuring the levels of said at least one pro-inflammatory cytokine in said biological sample comprises ELISAs, RIAs, multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems, or combinations thereof.

21. (Previously Presented) The method according to claim 20, wherein the means for measuring the levels of said at least one pro-inflammatory cytokine in said biological sample comprises multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection system.

22. (Canceled)

23. (Canceled)

24. (Withdrawn) An *in vitro* method of screening compositions for efficacy in the treatment of inflammatory diseases of the bowel comprising the steps of:

a) providing a biological sample comprising at least one gut-derived cell type;

b) treating said biological sample with the composition *in vitro*;

c) measuring the level of at least one anti-inflammatory cytokine and at least one pro-inflammatory cytokine in the biological sample at a time following treatment with the composition;

d) determining the ratio of the at least one anti-inflammatory cytokine to the at least one pro-inflammatory cytokine in the biological sample at a time following treatment with the composition;

characterised in that a ratio as determined in step (d) from the treated biological sample greater than the same ratio determined in an untreated control biological sample tested concurrently is indicative of the composition being an inhibitor of inflammatory diseases of the bowel, and a ratio as determined in (d) is the same as or less than the untreated control biological sample ratio is indicative of the composition not being an inhibitor of inflammatory diseases of the bowel.

25. (Withdrawn) The method of claim 24 wherein the biological sample comprises gut-associated lymphoid tissue.

26. (Withdrawn) The method of claim 25 wherein the gut-associated lymphoid tissue comprises mesenteric lymph node cells.

27. (Withdrawn) The method according to claims 24 comprising the additional step of stimulating the biological sample *in vitro* prior to step (c).

28. (Withdrawn) The method according to claim 24 wherein the anti-inflammatory cytokine is selected from the group consisting of interleukin-10, transforming growth factor-β, interleukin-4, interleukin-5, interleukin-13, and combinations thereof.

29. (Withdrawn) The method according to claim 28 wherein the anti-inflammatory cytokine is selected from the group consisting of interleukin-10, transforming growth factor-β, and combinations thereof.

30. (Withdrawn) The method according to claim 24 wherein the pro-inflammatory cytokine comprises interleukin-12, tumour necrosis factor-α, interferon-γ, interleukin-2, or combinations thereof.

31. (Withdrawn) The method according to claim 30 wherein the pro-inflammatory cytokine comprises interleukin-12, tumour necrosis factor-α, interferon-γ, or combinations thereof.

32. (Withdrawn) The method according to claim 24, wherein said ratio of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio interleukin-10/interleukin-12.

33. (Withdrawn) The method according to claim 24, wherein said ratio of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio transforming growth factor-β/interleukin-12.

34. (Withdrawn) The method according to claim 24, wherein said ratio of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio interleukin-10/interferon-γ.

35. (Withdrawn) The method according to claim 27 wherein said *in vitro* stimulation comprises a mitogen, probiotic, anti-CD3 molecule, or combinations thereof.

36. (Withdrawn) The method according to claim 35, wherein said *in vitro* stimulation comprises a mitogen.

37. (Withdrawn) The method according to claim 36 wherein said mitogen comprises a lipopolysaccharide, lectin, superantigen, or combination thereof.

38. (Withdrawn) The method according to claim 37, wherein said lectin comprises concanavalin A, phytohemagglutinin, pokeweed mitogen, or combinations thereof.

39. (Withdrawn) The method according to claim 24 wherein the means for measuring the levels of said at least one anti-inflammatory cytokine in said biological sample comprises ELISAs, radioimmunoassays, multiplexed ELISAs on microarray platforms, multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems, bioassays, Western blots, chromatograph-based separation systems, RT-PCR, competitive reverse transcription PCR, Northern blots, gene arrays, direct measurement of m-RNA, or combinations thereof.

40. (Withdrawn) The method according to claim 39 wherein the means for measuring the levels of anti-inflammatory cytokines in said biological sample comprises ELISAs, RIAs, multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems, or combinations thereof.

41. (Withdrawn) The method according to claim 40 wherein the means for measuring the levels of said at least one anti-inflammatory cytokine in said biological sample comprises multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems.

42. (Withdrawn) The method according to claim 41 wherein the means for measuring the levels of said at least one pro-inflammatory cytokine in said biological sample comprises ELISAs, radioimmunoassays, multiplexed ELISAs on microarray platforms, multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems, bioassays, Western blots, chromatograph-based separation systems, RT-PCR, competitive reverse transcription PCR, Northern blots, gene arrays, direct measurement of m-RNA, or combinations thereof.

43. (Withdrawn) The method according to claim 42 wherein the means for measuring the levels of said at least one pro-inflammatory cytokine in said biological sample comprises ELISAs, RIAs, multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems, or combinations thereof.

44. (Withdrawn) The method according to claim 43, wherein the means for measuring the levels of said at least one pro-inflammatory cytokine in said biological sample comprises multiplexed ELISAs using coded microspheres coupled with a flow cytometer detection systems.

45. (Withdrawn) A kit for screening compositions for efficacy in the treatment of inflammatory diseases of the bowel comprising a first measuring element or system for measuring at least one anti-inflammatory cytokine in a biological sample comprising a gut-derived cell type, a second measuring element or system for measuring at least one pro-inflammatory cytokine in a biological sample comprising a gut-derived cell type, wherein the difference in ratio of anti-inflammatory to pro-inflammatory cytokine between a control sample and a treated sample that has been stimulated with a composition can be determined, and usage instructions directing the user to determine the ratio of an anti-inflammatory cytokine to a pro-inflammatory cytokine, and that a ratio of anti-inflammatory cytokine to said pro-inflammatory cytokine greater than the control is indicative of an inhibitor of inflammatory diseases of the bowel.

46. (Currently Amended) A method of determining the efficacy of a probiotic as a treatment of irritable bowel syndrome ~~inflammatory diseases of the bowel~~ in humans *in vivo* comprising the steps of:

f) measuring the level of at least one anti-inflammatory cytokine selected from the group consisting of interleukin-10, transforming growth factor-β, interleukin-4, interleukin-5, interleukin-13, and combinations thereof and at least one pro-inflammatory cytokine selected from the group consisting of interleukin-12, tumour necrosis factor-α, interferon-γ, interleukin-2, and combinations thereof in a supernatant from cells cultured from a biological sample from a human subject wherein said biological sample is selected from the group consisting of a biopsy

sample from the bowel, peripheral blood mononuclear cells without *in vitro* stimulation, peripheral blood mononuclear cells with *in vitro* stimulation, gut lymphoid tissues without *in vitro* stimulation, gut lymphoid tissues with *in vitro* stimulation, and combinations thereof;

g) determining the ratio of the level of the at least one anti-inflammatory cytokine to the level of the at least one pro-inflammatory cytokine;

h) administering said treatment;

i) measuring the level of the at least one anti-inflammatory cytokine and the at least one pro-inflammatory cytokine in a supernatant from cells cultured from a biological sample from said human subject at a time following administration of said treatment;

j) determining the ratio of the level of the at least one anti-inflammatory cytokine to the level of the at least one pro-inflammatory cytokine following administration of said treatment;

wherein an increase in the ratio of the levels of anti-inflammatory cytokine to pro-inflammatory cytokine following the administration of said treatment is indicative of the efficacy of said treatment for irritable bowel syndrome ~~inflammatory diseases of the bowel~~, and no change or a decrease in the ratio of the levels of anti-inflammatory to pro-inflammatory cytokine following the administration of said treatment is indicative of lack of efficacy of said treatment for irritable bowel syndrome ~~inflammatory diseases of the bowel~~.

47. (Previously Presented) The method according to claim 46, wherein said ratio of the level of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio of the level of interleukin-10 to the level of interleukin-12.

48. (Currently Amended) The method according to claim 46, wherein said ratio of the level ~~the level~~ of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio of the level of transforming growth factor-β to the level of interleukin-12.

49. (Previously Presented) The method according to claim 46, wherein said ratio of the level of anti-inflammatory cytokine to pro-inflammatory cytokine is the ratio of the level of interleukin-10 to the level of interferon-γ.